DODPOPHM/USA/DOD/NADTR93013

PERFORMANCE ORIENTED PACKAGING TESTING OF CONTAINER, SHIPPING AND STORAGE, MK 753 MOD 0 FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS

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January 1994

FINAL

DISTRIBUTION UNLIMITED

Sponsoring Organization:
Program Executive Office-Theater Air Defense
(PMS 422-2)
Arlington, Virginia 22242-5160

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	01/94	POP Test (11/93)

4. TITLE AND SUBTITLE

Performance Oriented Packaging Testing of Container, Shipping and Storage, Mk 753 Mod 0 for Packing Group II Solid Hazardous Materials

5. FUNDING NUMBERS

6. AUTHOR(S)

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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and Transportation Center
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8. PERFORMING ORGANIZATION REPORT NUMBER

DODPOPHM/USA/DOD/NADTR93013

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Program Executive Office-Theater Air Defense
(PMS 422-2)
2531 Jefferson Davis Highway
Arlington, VA 22242-5160

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

Same as above

11. SUPPLEMENTARY NOTES

N/A

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This Performance Oriented Packaging (POP) test was conducted to ascertain whether the Mk 753 Mod 0 Shipping and Storage Container (DL 6212925) meets the Packing Group II requirements specified by the Code of Federal Regulations, Title 49 CFR, Parts 106 through 178, dated 1 October 1992. The packaged commodity used for the test was a simulated Mk 125 Warhead weighing 37.7 kg (83 pounds). This represents the current maximum commodity weight. To compensate for future growth variations in commodity and/or packaging, 3.6 kg (8 pounds) were added. Gross weight of the loaded container was 64 kg (141 pounds). The test results indicate that the container has conformed to the POP requirements.

14. SUBJECT TERMS	15. NUMBER OF PAGES
POP Test of Mk 753 Mod 0 Shipping and Storage Container	6
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

INTRODUCTION

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TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR 178.608. Containers #1, #2, and #3 were placed on a repetitive shock platform which has a vertical linear motion of 1-inch double amplitude. Movement of the containers were restricted during vibration in all but the vertical direction. The frequency of the platform was increased until the containers left the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour for each container.

2. Stacking Test

This test was performed in accordance with Title 49 CFR 178.606. Containers #1, #2, and #3 were used for this test. Each container was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a minimum height of 3 meters (including the test container). A weight of 255.8 kg (564 pounds) was stacked on each test container. The test was performed for 24 hours. The weight was then removed and the containers examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR 178.603. Six drops were performed from a height of 1.2 meters (4 feet) in the following orientations (three drops for each orientation):

a. Horizontally using containers #1, #2, and #3.

b. Diagonally on the edge of the cover assembly using containers #1, #2, and #3.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR 178.608(c): No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR 178.606(d): No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation.

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested, no rupture occurs which would permit spillage of loose explosive substances or articles from the outer packaging.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

The input vibration frequency was 3.6 Hz. Immediately after the vibration test was completed, each container was removed from the platform, turned on its side and inspected. No unfavorable distortion or deterioration was observed.

2. Stacking Test

Each container was inspected after the 24-hour period was over. No unfavorable distortion or deterioration was observed.

3. Drop Test

After each drop, the containers were inspected. The Mk 125 Warhead was completely retained by the container.

REFERENCE MATERIAL

A. Code of Federal Regulations, Title 49 CFR, Parts 106-178.

B. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers.

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TEST DATA SHEET

POP MARKING: UN 1A2/Y64/S/**/USA/DOD/NAD **YEAR LAST PACKED OR MANUFACTURED	
Nomenclature: Mk 753 Mod 0 Shipping and Storage Container	
Type: 1A2	**NSN:** 8140-01-367-7615
Drawing Number or P/N: DL 6212925	**Outer Packaging Material:** Steel
Dimensions: 29" H x 19.5" D	**Gross Weight:** 64 kg (141 pounds)
Closure (Method/Type): Removable Cover with Locking Ring	**Tare Weight:** 22.7 kg (50 pounds)
Additional Description: MS Drum	

PACKAGED COMMODITY:		
Nomenclature: See table 1	**NSN(s):** See table 1	
United Nations Number: See table 1		
United Nations Packing Group: II		
Physical State (Solid, Liquid, or Gas): Solid		
Vapor Pressure (Liquids Only): N/A	**At 50 °C:** N/A	**At 55 °C:** N/A
Consistency/Viscosity: N/A	**Density/Specific Gravity:** N/A	
Amount per Package: See table 1	**Flash Point:** N/A	
Net Weight: See table 1		

PACKAGED COMMODITY USED FOR TEST:	
Name: Simulated Mk 125 Warhead	**Physical State:** Solid
Consistency: N/A	**Density/Specific Gravity:** N/A
Test Pressure (Liquids Only): N/A	**Net Weight:** 41.3 kg (91 pounds)
Additional Description: The net weight includes the current maximum commodity weight plus an additional 3.6 kg (8 pounds).	

N/A = Not Applicable

TABLE 1
Commodities Approved for Shipping in the Mk 753 Mod 0 Shipping and Storage Container

NALC/ DODIC	NSN	Commodity Nomenclature	Packing Document Number	Haz Class/Div	UN Number	Units/ Package	Total Net Weight kg (lb)	Total Gross Weight kg (lb)
DWAF	8T 1336-01-366-0786	Warhead, Mk 125 Mod 0	OR-68/ 152	1.1D	0286	1	37.7 (83)	60.4 (133)

N/A = Not Assigned